

Avg. Level	Avg. Age	Physical		Biological	
		Physical Theory	Physical Practice	Biological Theory	Biological Practice
1.00	3.00	Cause and effect	The lever	The human body	Body care
1.25	3.25	Clubs and poles	Modifying trees and branches	Animal bodies; small domestic mammals	How to care for a pet
1.50	3.50	Different stones and their properties	Using stones	Edible plants and their properties	Gathering edible plants and mushrooms
1.75	3.75	Shaping stone	Building simple stone tools	Edible animals and fish	Hunting and fishing
2.00	4.00	Shaping wood with stone	Use stone tools to modify poles and clubs	Food preparation and preservation	Cleaning and preparing small game and fish using bone, wood, and stone
2.25	4.25	Handling fire	Use of stone & wood to control fire; use of fire to harden spear points	Advanced food preparation	Cooking vegetables, fish, and meat on open fires
2.50	4.50	Advanced fire handling and control combining wood and stone tools, theory and design	Hafted axes and choppers are made; stone fire carriers, simple weaving and knotting of vines & leather	Elementary tanning and use of bone, vines, and vegetable fiber	Skinning animals and fish, preserving leather, advanced cooking, preparing vines and vegetable fiber
2.75	4.75	The bow and fire making	Making bows and starting fires	Advanced food preparation; advanced tanning and bone work	Advanced cooking; clothes from animal hides; use of sinew and thongs; hunting with dogs
3.00	5.00	The use of clay and the bow and arrow; design of simple rafts	Making and baking clay pots on an open fire; making and using simple bows and arrows	Advanced food preparation including drying, smoking, & curing; health care	Cooking, drying, and smoking with clay pots; preparing and using medicinal herbs and poultices
3.25	5.25	Advanced paleolithic stone work of knives and axes; advanced bow making; advanced clay work without wheel; large rafts	Making stone tools to make other stone tools; making advanced bows and arrows; bellows and advanced pottery; building a large raft as a group project	Gathering seeds and planting edible plants; basic first aid	Gardening; preparing soil and cultivation; practice of first aid
3.50	5.50	Neolithic tools; construction of shelters; advanced counting; how to make a small dugout canoe and paddle	Construction of simple neolithic tools; the use of tally marks and stored pebbles; building a small dugout canoe and paddle	The biological need for shelter; building of lean-tos and simple teepees; clothes for extreme cold; simple agriculture	Construction of lean-tos and teepees; more advanced gardening; making bone needles and a parka
3.75	5.75	How to construct advanced neolithic tools to work stone and wood; more advanced counting and Arabic numbers to 10; how to build a large dugout canoe	Building advanced neolithic tools; working wood, simple carpentry, building semi-permanent structures; advanced tallying systems; building a large dugout canoe	How to make boots and moccasins from leather and plant fiber; how to know when to plant and when to harvest; taking care of goats and sheep	Construction of complete wardrobes of leather, plant, and animal fiber; more advanced gardening and animal husbandry

Avg. Level	Avg. Age	Psychosocial		Integration	
		Psychosocial Theory	Psychosocial Practice	Integrative Theory	Integrative Practice
1.00	3.00	How to communicate	Exchange of information	Ethics of personal obligation	Free-form drawing and painting, simple songs
1.25	3.25	Verification of information	Repeat same message from different source	Truth and lying, paleolithic stories	Free-form drawing and painting, paleolithic stories, drums
1.50	3.50	Games of information	Teams for sending and receiving messages	Advantages of cooperating vs competing; paleolithic stories	Songs, dancing, drawing, painting, telling stories
1.75	3.75	Making pictures for information communication	Drawing picture stories	Obligations of making oneself understood	Free-form art, stick-figure drawing for stories
2.00	4.00	Advanced picture stories	Making up stories with pictures	Ethics of separating fact from fiction; paleolithic stories	Wood carving and free-form painting; paleolithic stories created and drawn
2.25	4.25	Picture symbols which stand for complex events	Team communications games and "charades" using picture symbols	The difference between a symbol and the thing it symbolizes; paleolithic stories	Charcoal drawing on bark and stone; universal religious symbols; creating stories
2.50	4.50	Advanced picture symbols and counting	Making up stories by stringing together picture symbols which everyone can understand	Creation myths of paleolithic people	Making up creation myths and testing them
2.75	4.75	Rebus writing combined with picture writing	Making up stories with rebus and picture writing	Advanced creation myths of Native Americans and some religious beliefs, symbols	Native American art and what it expresses; free-form art for what students value
3.00	5.00	The notion of an alphabet and sound symbols	Stringing sound symbols together to make a word	The religions of native Americans and the evolutionary ethic	Percussion instruments, music, carving, dance, and art to express religious feelings
3.25	5.25	Reading advanced paleolithic stories with evolutionary ethical theme	Writing simple stories and accounts using alphabet, rebus writing, or pictures as desired	The importance of separating truth from fiction in our writing to avoid misleading others	Late paleolithic art and religion; student's expression of his own feelings about them
3.50	5.50	Reading stories and history of early neolithic life with evolutionary ethics theme	More writing of stories and accounts using alphabet, rebus writing, and pictures as desired	Simple analysis of neolithic culture and religions in light of the evolutionary ethic	Neolithic art and stone carving; clay figurines; self-expression of students
3.75	5.75	Reading more complex stories of neolithic life about religion and creativity in ancient Jericho and Mesopotamia	More writing of stories and accounts using alphabet and rebus writing, but no pictures, show difficulty of communicating numerical concepts over 10	Analysis of why neolithic culture advanced so slowly before the beginning of Sumer; the energy that went into religious ritual & the corrupt priestly bureaucracy	The flute and harp and the neolithic music possible for them; advanced neolithic art and religion; self-expression in all art media

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4.00	6.00	The concept of the wheel; smelting metal from ore; making a simple calendar from astronomical observations; counting and use of Arabic numbers to 1,000 for calendar making, time-keeping, and other uses	Making a potter's wheel and using it; making an advanced bellows driven by a pedaled wheel to heat a charcoal, earth, and clay oven; making a spinning wheel, a sundial, a simple loom	Advanced gardening; the making of cloth from plant and animal fiber; advanced care and management of sheep and goats; gourmet cooking with spices and herbs using ovens; making more advanced permanent shelters of wood and stone	Spinning fiber; simple weaving of cloth with no loom; wheat and corn cultivation; making bread with & without yeast; breeding sheep and goats with seasons; training dogs; constructing small stone and wood huts
4.25	6.25	More advanced metallurgy; the saw and how to use it; how to cast bronze tools, nails, the chisel, and metal hammer; advanced use of wheels; simple arithmetic; adding and subtraction with Arabic numbers; simple geometry	Construction of wheeled push carts; construct bronze tools and show how inferior they are to steel tools; use steel tools in all construction; use pick and shovel and push cart to build small irrigation system and buildings; show how arithmetic and simple geometry help construct these projects	Group design of large irrigated garden, suitable for self-sufficiency of 16 persons; advanced looms and weaving; advanced animal husbandry and selective breeding of sheep and goats; care of chickens and cattle	Construct and plant garden; advanced cooking and preserving of food; fermentation to produce alcohol, distillation of alcohol with copper still
4.50	6.50	Advanced bronze-based metallurgy and smelting of other similar metals; identify related ores and other rocks; simple glass technology; building an oxcart from wood, leather, and bronze; simple multiplication with Arabic numbers; more simple geometry, right triangles, and the circle; advanced calendar-making & time-keeping; how to make a simple boat with sail and oars	Smelt and cast advanced bronzes and similar metals; make and cast glass sheets; make mirrors of metal and glass; build an oxcart; show how arithmetic and geometry are useful; use detailed astronomical observations to make a better calendar, and show how arithmetic and geometry help; build a small sailing and rowing boat	Show how to use a simple plow and fertilizer to prepare land; show how to make fertilizer from minerals and organic substances; show how to cross-pollinate and hybridize plants and trees; show how to use advanced fermentation techniques to produce wine and alcohol; discuss effects of alcohol as preservative and drug; storage and preservation of grain	Advanced agriculture and gardening projects; make fertilizers, crossbreed and hybridize plants; grow grain and grapes; ferment to alcohol, distill alcohol, use alcohol as fuel and preservative, use as disinfectant; cultivation of yeasts, and advanced baking
4.75	6.75	More advanced arithmetic and geometry, division of numbers, simple fractions; creation of more advanced sailing craft, the ideas behind a horse-drawn war chariot, the compound bow with metal-tipped arrows, how to construct the two-person war chariot and its relationship to the oxcart; the Babylonian abacus theory	Show how arithmetic and geometry contribute to following technologies built by groups; build a more advanced sailing craft; build a war chariot using steel, wood, and leather; show how much more difficult it was with only bronze; build compound bow with bronze-tipped arrows; practice with bow until expert, and practice with war chariot	Domestication and use of the horse as a biological machine, special care and breeding required by horse, horse behavior and anatomy, equipment for controlling horse and how to make it	Horse training and use for farming and pulling chariots, speed comparisons, training horse for chariots and bareback riding

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4.00	6.00	Reading stories in personal terms about the possible prehistory of the Sumerian people; vocabulary development and the practical use of grammar	Write stories of fiction and personal activity using only alphabet; show how convenient it is to know when a sentence starts and ends, and how punctuation prevents misunderstanding	The ethics of larger groups; how it is possible for several octets to cooperate if they have common rules and objectives; how ancient civilizations were slave-based and ruled by priestly bureaucracies	Students construct rules and goals of cooperative behavior in order to build large-scale projects, buildings, irrigation systems to benefit hundreds of persons
4.25	6.25	Realistic but fictionalized history of the founding of Sumer and how Sumerians created their culture up to the time of the invention of writing; show how the religion and its ritual became overwhelmingly important, and how by controlling food the priests controlled people, warriors, and kings	Write stories of fiction and personal activity; write essays on behavioral ethics; use proper punctuation for clarity of ideas and teach correct punctuation for students; have students ethically analyze in writing the history of Sumer and show what might be wrong	The ethics of individual rights; show that taking rights away from individuals for a larger group damages the group it is supposed to help; show how creativity is important to progress and how liberty is important for creativity	Students study Sumerian art and try to express their own feeling about Sumer in ceramic figurines similar to the Sumerians; stone sculpture project; reproduction of Sumerian relics and artifacts
4.50	6.50	Read a simple non-fictional history of Sumer, show their writing and accounting systems and note their defects; show how clay as prime resource led to cuneiform; endurance of clay records; read full accounts of Sumerian myths, including Garden of Eden; Gilgamesh, and Noah	Write an analysis of Sumerians' history and their collapse; write an analysis of their myths and what they mean; write your own myths to communicate the same ideas as the Sumerian myths; write a creative story of your own choosing	Ethical analysis of the rise and fall of Sumer, the ethical nature of the conquerors of Sumer, their strengths and weaknesses, the weakness of theocracy and hereditary aristocracy, why these entropic systems went on for so long	Creative synthesis; high Sumerian art compared to art of conquerors; artistic group project to communicate the rise and fall of Sumer through music, painting, sculpture, and dance
4.75	6.75	Read a simple world history of the Ecumene from the fall of Sumer to 600 BC; show how little progress and creativity there was until then; show how Aryans spread Sumerian civilization to the entire old world and possibly to the Americas; read literary examples of each major culture	Write an ethical analysis of each major culture and why they could not significantly improve on Sumerian civilization; write an analysis and interpretation of their literary works; write your own story to express what you feel about this period of history	An ethical analysis of the Sumerian religion and those that followed; show how ethical vitality in primitive cultures can lead to conquest of more advanced civilizations; show how religions that seek reward for ethical behavior are destructive; show how it was necessary to invent morality	The art forms of Babylon, Egypt, Crete, pre-Confucianist China, and India; make your own version of these art styles; improvise music on the instruments of these times; do a group art project on this period of history

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5.00	7.00	The smelting of iron and simple steels, forging iron and blacksmithing; simple astronomy and navigation, advanced sailing ships that might have crossed the Atlantic; the iron forging necessary for controlling a horse in battle; pre-Greek geometry and arithmetic using Arabic numbers, advanced theory of the Babylonian abacus	Smelt ore, forge from iron a complete set of tack for a horse, plus horseshoes; forge and make iron sword and spear; make large clay jars for storing grain, oils, and wine; begin one-year sailing ship construction project for group; show how geometry and arithmetic help in the above projects, build a Babylonian abacus	Advanced study of equestrianism for war, shooting a compound bow while riding horseback, the use of the lance and the sword from horseback; mammalian reproduction in detail, nursing and care of young mammals; processing milk into cheese and yogurt	Horse handling, training, and riding; grooming and care of horses, shodding and equipping the horse, the use of different bits, saddles, and stirrups; mammalian reproduction and breeding; comparisons of dogs, cats, sheep, goats, cows, and horses; cheese and yogurt from cow's milk; extract oil from fruits and nuts; make and store wine; optimal physical training of the human body
5.25	7.25	Continue with projects begun previous quarter	Continue with projects begun previous quarter	Continue with projects begun previous quarter	Continue with projects begun previous quarter
5.50	7.50	Advanced metallurgy, casting bronze sculptures through lost wax process; making of hard steel alloys, nails, bolts, and screws; making advanced presses and catapults; fractions and decimals, empirical basis of Pythagorean Theorem, right triangles, circles, spheres, and parallelepipeds	Continue work on sailing ship, do precision bronze castings; make knives using hard steel alloys; make nails, bolts, screws, presses, and catapults; show applications of mathematics and geometry to the above	Human reproduction, comparative male and female anatomy, hormonal cycles, fertility cycles, puberty and emotions, lactation and nursing, care of infants, normal patterns of growth for young boys and girls	Advanced breeding of animals and plants, extraction of fats and oils from vegetables, fruits, and seeds; extract animal fats from carcasses and meat; work in nursery caring for small children 1-2 years old
5.75	7.75	The geometry and mathematics of Pythagoras, several proofs of his theorem, the Pythagorean solids, the harmonics of vibrating strings and the physical basis of music; geometry applied to navigation, astronomy, building and surveying; the technology of glass, glass blowing	Construct the Pythagorean solids, use several approaches to making dodecahedron and icosahedron; construct navigational computer, advanced abacus; construct glass bottles, mirrors, parabolic mirror; finish sailing ship	Human health and the Greek medical tradition, Aesculapius and Hippocrates; a healthy mind in a healthy body; physical culture and optimal health; diet, exercise, and health	Gardening and preparation of food for optimal health, an exercise plan for lifetime health, strength, and energy; construction of a glass still; care of young infants

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5.00	7.00	The story of Zarathustra; how he changed the Persian people and how they went on to create the world's greatest empire until conquered by Alexander; the Zoroastrian religion and myths in detail	Analysis of ancient Persian history and religion; write a story of how Persian history might have been different if the religion had been different	Ethical analysis of Zoroastrian religion and ethical system, strengths and weaknesses, and how it was doomed to failure	Ancient Persian art, architecture, music; analyze and reproduce style according to your own feeling about this culture; do a group project expressing ancient Persian civilization
5.25	7.25	The story of Confucius and his teachings and how they changed China; the books of Confucius are read, discussed, and compared to the philosophy of Lao Tse; the interaction of Taoism and Confucianism in Chinese history is discussed	Written analysis of each of the books of Confucius and stories about Confucius; an analysis about Lao Tse; writing of imaginative stories about life in China; essay on how you personally feel about Confucius and Lao Tse	Ethical analysis of Confucianism and Taoism as ethical systems, as ways to knowledge, and the civilization they produced; what was right and what was wrong and predictions	Ancient Chinese art to Tang dynasty, analyze and reproduce style in sculpture, painting, and music; use Chinese style to express your feelings about classical Chinese culture in group art project
5.50	7.50	The story of Buddha and his teachings and how they changed India and the East; emphasize the basic ethical nature of Buddhism and its tolerant compassion toward others; show how Buddhists became psychosocial specialists and stopped innovating in the natural world; compare to Hinduism	Write essays on the meaning of Hinduism and Buddhism and how they relate to you; how Buddhism and Hinduism relate to each other, how you would feel and act if you were suddenly put into a Buddhist or Hindu society; give evidence for and against reincarnation, what impact these societies have on the world, predictions	Hinduism and Buddhism in light of the evolutionary ethic and the eight Ethical Principles; the historical impact and consequences of those religions; the ethics of the caste system; why Buddhism is more successful as an export; common Aryan origins of Hinduism, Buddhism and Zoroastrianism	Experience directly Buddhist and Hindu meditation and its comparison to auto-poiesis; Buddhist and Hindu art; draw mandalas of your own, sculpt in Buddhist and Hindu style, make up mandalas, learn to play Buddhist and Hindu music; perform dances, do art works expressing how you feel about Buddhism and/or Hinduism
5.75	7.75	Early Greek history to Thales; the <i>Iliad</i> and the <i>Odyssey</i> ; the story of Thales and Pythagoras and how they laid part of the foundations of Western civilization; the rational and mystical as reflected in those two men; Thales and ethics; Pythagoras and religion	Write an essay on the ethics of the characters in the <i>Iliad</i> and <i>Odyssey</i> ; the ethics of the mythical characters and gods, the attitudes toward women and their role in Greece; make up a Greek-style myth of your own	The warlike Aryan tradition and how it led to Greek culture, the obsession with domination and personal freedom, the oppressiveness of a slave-based culture, the extreme military specialization of Sparta; why a love of truth and intelligence is not enough if there is no love for others	Geometric art using Pythagorean and Greek principles, composition of music using Pythagorean theory of harmonic scales; begin a sculpture project in the Greek style; Greek music and dances including those of Sparta

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6.00	8.00	The geometry of Euclid using modern algebraic notation, introduction to algebra as it applies to geometry, use of geometry and vectors to sail against the wind; give many examples of the practical applications of geometry in many fields; the Atomic Theory of matter of Democritus; other Greek theories of water, earth, air, and fire	Use geometry to calculate size of the earth, distance to the sun, size of the sun; use geometry to construct and use a large catapult; build a bridge by geometric design; work with glass making lenses and mirrors; begin design of ship that can sail against the wind; practice sailing the ship built last year	Internal anatomy of vertebrates, fish, frog, rat, and pig; the true role of each organ and what Aristotle and Galen thought they were for; Greek theories of evolution compared to modern theory; point out how dangerous it is for authorities to be wrong; the value of doubt	Dissection of fish, frog, rat, and pig; identification of all major organs and bones; practice in meat processing, packaging, and preservation without refrigeration; continue practice in caring for young infants in first year
6.25	8.25	Continue the previous work and continue with the geometry and science of Archimedes; use modern algebraic notation and point out how difficult the work of Archimedes was because of notation; theory of pulleys and parabolic mirrors; show how abacus gives answers to the notational problem	Construct a system of pulleys and a block and tackle; construct parabolic mirrors to collect solar energy by heating water, and work out schedule for how mirrors should be aligned as function of time of year and day; finish design of ship	Detailed survey of Greco-Roman medicine and the modern versions of these beliefs; the complete guide to the use of herbs and medicines for curing and preventing illnesses; taxonomy of herbs; review Greco-Roman theories of biology	Plant a garden of medicinal herbs, take field trips to collect medicinal herbs, prepare poultices and medicines as have been verified by time and modern usage
6.50	8.50	The works of Archimedes continued, the school of Alexandria, and the continuation of Greek mathematics, science, and technology; full development of algebra and trigonometry using modern notation; solid geometry and trigonometry, applications to navigation, the construction of lenses	The design and construction of water pumps, the design and construction of steam turbines; practical lens making continued; begin modification of ship made in fifth year to sail against the wind; glass blowing continued	Study of preventive medicine; germ theory of infection and how hygiene can prevent it (although Greeks had lenses, no one discovered germs for 2000 years), parasites and their life cycles, the danger of eating meat, the importance of cooking and cleanliness	Use lenses to study small organisms, examine parasites in intestines of animals, show how maggots hatch from fly's eggs; basic entomology observed; use microscope to study basic parasitology
6.75	8.75	Continuation of the study of the science, technology, and mathematics of the School of Alexandria	Continuation of the above; make crude telescope and microscopes	The study of microscopic life; how lack of scientific method inhibited medical practice for 2000 years; how to prevent the spread of disease; viruses as submicroscopic organisms not to be discovered for 2000 years	Study of amoebas and major human parasites; animals as sources of infection for humans; the parasitic worms

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6.00	8.00	Greek history from Thales to the Roman conquest, the <i>Dialogues</i> of Plato, a survey of Aristotle, a survey of the Greek plays and the fables of Aesop, the ethical teaching of Socrates, the Macedonian interlude and Alexander	Perform one play by Sophocles and one by Euripides; write a critique of Greek culture and why it failed; write a critique on Socrates' life and on whether Socrates should have drunk the hemlock; write an epic poem on Greece	Ethical analysis of the teachings of Socrates, Plato, and Aristotle; show how the lack of love and the will to power forced Greece to destroy itself; consider that the great thinkers of Greece never had power nor were they free of tyrants except at first	Write a play in the Greek style on Greek themes, critique one another's plays, finish sculpture in the Greek style, do a group art project on the meaning of Greece
6.25	8.25	Greco-Roman history from the start of Rome to the time of Jesus; analysis of the works of Lucretius; what the Romans had of their own and what they learned from the Greeks; Roman ethics and theories of government; how tyranny can always replace a democracy by promising to take from the rich and give to the poor	Learn Greek and Latin roots to English and scientific and technical terms, emphasis on nouns; the Greek alphabet, brief survey of Greek and Roman grammar and its complexity; show how English grammar is simpler, more practical; show how as vocabulary expands grammar can be simplified; write essay comparing Greek and Roman culture	Sexual ethics and how the Greeks and Romans related to them; pleasure as an end in itself; the exploitation of women, exclusion of women from all important decision making, women as sexual objects, the absolute authority of the father; Roman law and evolutionary ethics, subservience to the state and ethical principles	Design a domed and vaulted building made of wood and masonry, calculate stresses, and show the use of the arch and dome; play Roman music and practice sports, do a group art project on the meaning of Rome under Augustus
6.50	8.50	The history of the Jews; read all of the <i>Old Testament</i> , the ethical principles derivable from the <i>Old Testament</i> , the mixing of ethics, techniques, and ritual; the Jewish interaction with the Aryans after the Babylonian captivity, the resistance to Hellenization, the conquest by Rome, the Jewish bureaucracy, sampling of the <i>Talmud</i>	Essay analyzing <i>Old Testament</i> as a historical account and as a myth; compare to <i>Iliad</i> and <i>Odyssey</i> ; Jewish laws are analyzed in terms of their ethical value and their political implication; essay on Judaism as an ethical system	Ethical analysis of the <i>Old Testament</i> , personal ethics, health implications of many of the Jewish laws; show how the means became the ends and how ritual destroys ethics; the destructiveness of becoming specialized in one's own religion	Jewish abstract art in the form of the Menorah and the Star of David; paint an art work using Jewish symbols to express a Jewish theme without including the human form or animals; Jewish music and Passover songs
6.75	8.75	The <i>New Testament</i> and the life of Jesus, the ethical teaching of Jesus, Jesus as a Jewish reformer and rabbi, the deification of Jesus, the teachings of Jesus in relationship to the Greco-Roman religion, St. Paul and Christianity as a synthesis of Judaism, Jesus, and Greco-Roman religion and philosophy	Write an essay on Jesus and the meaning of his life and death, essay on the criticisms of Jesus against traditions and the Jewish bureaucracy, essay on whether Jesus could have studied in India and/or Tibet, essay on Jesus' teaching and the school of Alexandria	Ethical analysis of the <i>New Testament</i> , the high ethical content in the teachings of Jesus compared to their corruption by St. Paul, the mythification & deification of Jesus in the Roman tradition by those who did not know him, analysis of synoptic gospels showing how they were all derived from a simpler, common source	Draw and paint art showing the unification of Judaism, the teachings of Jesus, and the Greco-Roman religion (Michelangelo's Sistine Chapel is best model); write a poem expressing this synthesis; do a group art project expressing the essence of Christianity

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7.00	9.00	Consolidation of Greek mathematics and geometry using modern notation; practical chemistry in purifying common elements from their ores and making chemical compounds such as sulphuric acid, nitric acid, hydrochloric acid, aqua regia, and gun powder	Use geometry and mathematics to design a cathedral using Roman arches, vaults, and buttresses; isolate elements from their ores; make acids and simple compounds, gun powder, and paints; make mortars and cements; continue modification of sailing ship	Further study of microscopic life, protozoa, mites, worms, and other microorganisms that live on and in mammals; diseases they cause and symbiosis they provide	Microscopic observation of microorganisms, classification in modern terms; observe sea plankton, sponges, and hydra, and observation of their life cycles
7.25	9.25	Mathematical modeling of nature through advanced algebra, geometry, and trigonometry; derive solutions to quadratic and cubic equations; advanced navigation, the compass and the theory of the sextant; advanced geometry, trigonometry of arches, domes and vaults	Masonry work, making stone arches & vaults; begin construction of small wooden house with some masonry; continue to work with lenses and practical optics, make large reflecting telescope, make better microscope; make additional chemical compounds, acids and paints, dyes and cements; construction of an astrolabe; practical astronomy; finish modifications on sailing ship	Animal systematics, invertebrate zoology, comparative organ systems, organ structure and function, cell theory of animal structures	Laboratory dissection and study of the invertebrate phyla in an evolutionary context; detailed experimentation for function of organ systems and microhistology
7.50	9.50	Mathematical modeling of nature continued; quartic equations; heliocentric model of solar system compared to Ptolemaic; comparison of Viking ships as fast raiders to more seaworthy sailing ships; prepare for two-week ocean trip, theory of alchemy	Continue work with wood and masonry in house; begin construction of accurate water and weighted clock; begin construction of astronomical telescope with instruments; alchemical preparation for isolating elements and making compounds; the alchemical symbols as archetypes	Continue classification of invertebrates for all remaining major phyla, specifying organ functions and histology; show how all metazoa have same types of cells and all start as single cell, simple embryo egg	Laboratory dissection and microscopic observation of major invertebrate phyla; tissue and embryology; transition species to vertebrates, tunicates, and amphioxus
7.75	9.75	Begin study of conics and analytical geometry; begin study of the dynamics of falling bodies and the pendulum; continue study of alchemy, showing how acceptance of wrong hypotheses impeded progress; consider measurements of time, temperature, and position	Finish wooden house; using telescope and clocks, begin observations of movements of planets and earth relative to sun, and deduce Kepler's laws; take a two-week ocean trip; begin construction of sextant	Continue classification of invertebrates; compare with anatomy of simpler vertebrates; study all organs and their physiology and function; identify cells common to vertebrates and invertebrates	Microscopic observations and dissection of simple vertebrates and their organs; observation of simple embryology and comparison to invertebrate embryology; full dissection of shark

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7.00	9.00	The Roman Empire and its interaction with Christianity, the Greco-Roman disdain for manual labor, the Christian disdain for the natural world, the Gnostic Christians, the stagnation and disintegration of the Roman Empire until the rise of Islam	Write speculative essay on how Roman Empire might have endured and what the world would be like if it had; write speculative essay on how Christianity would have developed if the Gnostics had not been persecuted	The ethical decay of Rome; Roman bureaucracy; how the Catholic bureaucracy established itself; Catholic intolerance of deviant views; persecution of heretics; inferiority complex about pagan knowledge; the destruction of Alexandrian library; Hypatia	Finish design of cathedral; paint Christian symbols that express what is best in Christianity; sing Gregorian chants in Latin after studying translations; do an art project expressing the meaning of the Catholic church
7.25	9.25	The rise of Islam; read the Koran; early history of Arabia to 7th century; relationship of Islam to Zoroastrianism, Judaism, Christianity, and the surrounding cultures; the political vacuum in the Middle East	Essay on why so many Jews rejected Islam; essay on why Islam was able to grow and expand so rapidly; essay on the ethical contradictions within Islam compared to Judaism and Christianity	Islam as a closed system; how Islam induces fanaticism; its comparison to Christianity; why Christianity is more open in spite of church bureaucracy; Islam and creativity; the reason for Islam declining as Christianity rose	Islamic abstract art; how lack of representational art diminishes creativity; draw abstract designs in the Islamic style; Islamic mandalas; paint representational art of Islam; compare to Persian and Mogul art forms
7.50	9.50	The great theologians, St. Augustine, St. Gregory, Averroes, Avicenna, Maimonides, St. Anselm, Abelard; show their depth and breadth of vision; the weakness of having orthodoxy to defend; the Holy Roman Empire and its relationship to Islam, India, and China; Charlemagne and his successors	Essays on the "proofs" of the existence of God and the ontological arguments; essay on the humanizing role of the Church while it bureaucratically decayed; essay on priestly celibacy and its implications; write your own ideas about God	The dominance of ideology and bureaucracy over ethics and truth, the preservation and distortion of the teachings of Jesus, the fundamental power of the teachings of Jesus in spite of the negative elements	Compare Byzantine with Western religious art and paint a synthesis of the two; paint a synthesis of Christian, Chinese, Hindu, and Muslim art of the period; begin study of the organ
7.75	9.75	St. Thomas Aquinas and the rise of the Holy Roman Empire; the feedback produced by the great schism; the decline of Byzantium relative to the newly emerging West; Roger Bacon and the rise of science; the apparent cultural superiority of Islam, India, China, and Byzantium	Write essay on the theology of St. Thomas Aquinas, indicating the holes in his arguments; essay on Thomistic ethics; the schism analyzed in theological and bureaucratic terms, why schism was so important to Western progress	The relationship of rational theology to mathematics; the church as an arbiter of power between barbarian states; the moral authority of the church in a world of brute force; the cathedral as the synthesis of Western technology, art, and religion	Study and do detailed drawings of major cathedrals; plan to implement construction of cathedral design; begin construction on 1/10 scale model in stone

Avg. Level	Avg. Age	Physical		Biological	
		Physical Theory	Physical Practice	Biological Theory	Biological Practice
8.00	10.00	Continue with study of analytical geometry; begin solid analytical geometry using Cartesian notation; study the design of clocks, thermometers, and astronomical instruments; a study of Kepler and his ideas about nature and the music of the spheres	Continue with mini-cathedral building project; build full-fledged observatory with telescopes, but in spirit of Tycho Brahe make observations to deduce Kepler's laws; take two-week ocean voyage on sailing ship; discuss how Europe extended itself throughout the world in the 16th century	Continue vertebrate comparative anatomy through higher mammals and relate to human anatomy; show how embryology of all vertebrates overlaps at stages; relate to Greek evolutionary theories	Dissect and study vertebrate anatomy, tissues, and organs; go through modern systematics for all major mammalian orders; study embryology of related groups with microscope; the fetal pig and its full dissection
8.25	10.25	The early basis of the scientific revolution, Francis Bacon's <i>Novum Organum</i> , Boyle's studies, Galileo, the inventions of Leonardo da Vinci, the notion of experimental "proof", finish analytical geometry and learn elementary calculus of variations, the concept of limit, and early concepts of calculus to explain Kepler's laws	Continue observation project, build improved clocks, finish sextant, finish mini-cathedral, study map making and various forms of map projections; set up experiments to test Boyle's laws, simple gas laws, experiments to test circulation of the blood	Human anatomy in detail; all organs, tissues and bones, gross structure of the brain; embryology using the fetal pig, use anatomical drawings of da Vinci and Vesalius, plus <i>Gray's Anatomy</i> ; these integrated studies will last a year	Dissect human cadavers, male and female; observe tissues, and relate to other mammals; show similarity of all organs for all mammals; note how different human brain is
8.50	10.50	The Newtonian synthesis; full study using modern notation of <i>Principia Mathematica</i> and the <i>Opticks</i> ; derive Newton's laws from Kepler's observations; derive calculus from the need to mathematically describe the laws of motion and gravity	Begin making windmill and waterwheel; predict the orbits of the planets using Newton's laws and a few astronomical observations; predict the eclipses of the sun by the moon at different spots of interest on the earth; repeat Newton's experiments showing that light is a system of particles, and that white light contains the spectrum	Continue studies of human anatomy and embryology	Continue anatomical dissection and microscopic studies; learn micro-techniques and make your own slides
8.75	10.75	Derive the calculus up to the use of simple differential equations; derive the formulas for optics and the creation of compound lenses; compare Newton's and Leibnitz' approach	Continue work on windmill and waterwheel; build a Newtonian reflecting telescope; built a chromatically-corrected set of compound lenses for the telescope already constructed; make an improved microscope	Continue studies of human anatomy	Continue work of previous quarter

Avg. Level	Avg. Age	Psychosocial		Integration	
		Psychosocial Theory	Psychosocial Practice	Integrative Theory	Integrative Practice
8.00	10.00	The rise of humanism leading to the Renaissance and the Reformation; the writings of Erasmus, Luther, and Calvin; the Council of Trent and the rise of the Jesuit order; Giordano Bruno, the philosophy of Descartes, and a review of his contemporaries	Essay on the ethical implications of the Reformation, were the Protestants any less bureaucratic? mutual discussion of essays among the octets; essay on the ethical implications of the scientific method and the new philosophy	The literary synthesis, Dante's <i>Divina Comedia</i> , Cervantes' <i>Don Quixote</i> , Marlowe's <i>Dr. Faustus</i> ; the music of Monteverde and Palestrina; the art of Bosch, Leonardo da Vinci, and Michelangelo	Write an epic poem about the Christian view of Hell; write a play about a modern Don Quixote; continue study of organ and harpsichord; compose and perform music in the style of Monteverde and Palestrina
8.25	10.25	Hobbes, Montaigne, and Spinoza; read Spinoza's <i>Ethics</i> without analyzing proofs and note how this is a huge leap over the philosophy of Descartes and is the first totally rational treatment of ethics in history	Apply Spinoza's ethics to solving problems in practical ethics, politics, and religion; relate Spinoza's ethics to Christianity, Islam, and Judaism; apply Spinoza's model to formulating a model of the universe and evolution; write an essay on the meaning of Spinoza	The literary synthesis continues; read critically Shakespeare's <i>Romeo and Juliet</i> , <i>Othello</i> , and <i>Hamlet</i> ; study the music of Handel; study advanced musical theory and composition	Continue study of organ and harpsichord; build a harpsichord as a group project; write a last act to <i>Hamlet</i> in which Hamlet lives; play the music of Handel
8.50	10.50	The philosophical contemporaries of Spinoza, Leibnitz, Locke, and Hume on improving the understanding; world history from 1000 AD to 1775	Essay on the hostility to Spinoza; an ethical analysis of the lives of Spinoza and Leibnitz; essay on why Europe embraced the scientific method and modern philosophy while the rest of the world did not	Spinoza's ethics, Christianity, Judaism, and respect for human rights; the rise of democratic ideology; Islam becomes totally entropic; conservative belief systems in the rest of the world; European predation	Group project to perform St. Matthew or St. John <i>Passion</i> of Bach; all learn to play the <i>Musical Offering</i> , the <i>Art of the Fugue</i> , in an octet; each octet does its own orchestration for the <i>Art of the Fugue</i>
8.75	10.75	Human rights and 18th century philosophy; Voltaire, Rousseau, Diderot, and the Encyclopedists; the American Revolution; the philosophy and writings of Thomas Jefferson, the social contract, and the Federalist Papers	Essay on Rousseau and irrationalism; essay on the libertarian ideal and the democratic compromise; essay on the U.S. founding fathers allowing slavery to continue—was losing the revolution and hanging a better alternative? Write scenario on what would have happened if there had not been tolerance of slavery	The artistic synthesis continues; further study of the <i>Art of the Fugue</i> and the music of Mozart; the pessimistic writings of Jonathan Swift, a tragic interpretation of the democratic experiment	Compose and perform a conclusion to the <i>Art of the Fugue</i> ; perform as a group project one Mozart opera of students' choice

Avg. Level	Avg. Age	Physical		Biological	
		Physical Theory	Physical Practice	Biological Theory	Biological Practice
9.00	11.00	Begin advanced calculus and partial differential equations; detailed study of the work of Lagrange and Euler, the calculus of variations from Newton to Lagrange, elementary probability theory from Pascal to Cauchy and Laplace; applications in optics, astronomy, theory of heat	Begin construction of simple steam engine, making from scratch, doing all machining of parts by treadle-driven lathes and water and windmill power, check the detailed mathematical models against astronomical observations	Conclusion of the study of human anatomy and embryology	Conclusion of dissections and microscopic observations; the general functioning of the human body has been observed
9.25	11.25	Continue work of previous quarter; detailed theory of steam engine, the work of Lavoisier, Priestley, and Dalton	Continue above project, switching to electrical machinery; do early experiments in electricity by Gauss, Coulomb, Ampère, and Volta; the atomic model of chemistry and experiments	Begin study of animal physiology and describe biochemistry through mid 19th century; repeat experiments of Helmholtz in biophysics	Experiments in basic physiology showing how human body consumes oxygen and produces carbon dioxide; human body as a heat engine
9.50	11.50	Continue work in chemistry; the work of Laplace and Carnot, the laws of thermodynamics, the experiments of Faraday; advanced studies in partial differential equations; wave mechanics in optics; begin study of the works of Gauss	Continue chemistry experiments; finish work on steam engine; test efficiency using Carnot's concepts; begin repeating the experiments of Faraday and empirically derive the basic laws of electricity and magnetism, including Ohm's law	Animal physiology and biochemistry continued; the work and life of Pasteur	Experiments in animal physiology and biochemistry continued
9.75	11.75	Maxwell's work on the wave theory of light and the derivation of Maxwell's equations and their applications; continue study of Gauss' mathematics and physics	Electromagnetic motors and generators, construction of batteries, transmission of electromagnetic waves, early work of Tesla, the telegraph and the wireless constructed	A course in botany and plant physiology; begin experiments in plant genetics after Gregor Mendel	Study and dissection of major plant species; field studies, microscopic dissection, plant breeding per Gregor Mendel

Avg. Level	Avg. Age	Psychosocial		Integration	
		Psychosocial Theory	Psychosocial Practice	Integrative Theory	Integrative Practice
9.00	11.00	Detailed analysis of the American and French Revolutions; detailed analysis of the writings of Jefferson and his correspondence; comparisons between Jefferson, Washington, and Napoleon; how Napoleon betrayed the French Revolution in the pursuit of personal power; how the U.S. government betrayed the Libertarian ethic	Write essays comparing the ethical course of the American and French Revolution; relate the ethics of Spinoza to these revolutions; relate to evolutionary ethics and show where they went wrong	Artistic synthesis in the early work of Goethe and the music of Beethoven; ethical synthesis in the philosophy of Lessing, Goethe, and Moses Mendelssohn and their interpretations of Spinoza	Reorchestrate and perform Beethoven's <i>Grosse Fugue</i> for octet; read Goethe's prophetic poetry; write a sequel to the <i>Sorcerer's Apprentice</i>
9.25	11.25	The philosophy of Kant, biography, <i>The Critique of Pure Reason</i> and <i>The Critique of Practical Reason</i> ; compare to Spinoza; Kant's cosmology compared to LaPlace; explain Catholic hostility	Write essays on the scientific and ethical implications of Kant's philosophy; analyze in terms of the evolutionary ethic	Artistic synthesis continued in the work of Goethe and Beethoven; Goethe's <i>Sorcerer's Apprentice</i> and pessimism, the romantic hope and self-delusion	Produce as a group project Goethe's <i>Faust</i> and performance of Beethoven's <i>Ninth Symphony</i> for several octets
9.50	11.50	The philosophy of Hegel—how he could be so wrong and so influential; Hegel and the misinterpretation of Spinoza; Hegel's theory of history and ethics; Hegel as the father of Marxism and Nazism; de Tocqueville as a visionary and prophetic historian	Essay explaining Hegel's influence through present times; a comparison of Spinoza and Hegel—how could Hegel so misunderstand Spinoza and deceive himself and others? Why was de Tocqueville so accurate in his predictions?	The romantic poets, Byron, Shelley, and Wordsworth; the art of Watteau, Houdon, David, and Degas; the music of Berlioz and Liszt; Wagner as the musical equivalent of Hegel	Write epic poetry on a hopeful future from a romantic perspective; do a musical satire on a Wagner opera; paint a heroic romantic painting
9.75	11.75	A history of the world from 1775 to 1910; development of major ideas and philosophies, with particular attention to USA, Britain, France, Germany, Japan, and Russia; basic economics from Adam Smith to Marx and Engels	An essay explaining the Newtonian model and its influence on the intellectual history of the world, why Islam, India, and China were so far behind, why Japan was able to catch up	An ethical analysis of European and American imperialism; libertarian and socialistic ethics; the ethical turmoil of the age of liberty and social obligation; read <i>War and Peace</i> by Tolstoy; the paintings of Turner and the Impressionists	Read and analyze Pushkin, Melville, Dickens, Hugo, Balzac, Dostoyevski, Tolstoy, George Eliot; study the music of Mahler and perform <i>Das Lied von der Erde</i>

Avg. Level	Avg. Age	Physical		Biological	
		Physical Theory	Physical Practice	Biological Theory	Biological Practice
10.00	12.00	Gauss' mathematics and physics continued; general thermodynamics, the work of Boltzman Clausius and Gibbs, Maxwell's demon, the inventions of Edison and Tesla; the work of Mendeleev and the beginning of organic chemistry; probability theory as understood by Gauss and Galton	Construction of AC generators and regulators, simple radios, light bulbs, and recording devices; begin design and construction of simple internal combustion engine; experiments in organic chemistry and synthesis of organic compounds	The life and work of Charles Darwin and Wallace, the evolution of evolutionary ideas, the theory of natural selection, and the three laws of thermodynamics; the work of Pasteur continued	Each student gathers evidence for and against Darwinian evolution, taking into account basic genetic knowledge and probability
10.25	12.25	Non-Euclidean geometry and statistical mechanics; introduction to systematic probability theory and statistics; continue work in thermodynamics and organic chemistry; the work of W.R. Hamilton and Henri Poincaré is studied	Continue work of previous quarter; construct interferometers and repeat the Michelson/Morley experiments; repeat experiments of Planck to derive Planck's constant; develop and derive the special theory of relativity; begin construction of automobile; continue internal combustion engine project	Neo-Darwinian theories of evolution and evolutionary genetics up to R.A. Fisher's <i>The Genetical Theory of Evolution</i> ; explain disease and parasites in evolution	Do genetic experiments with fruit flies and molds, giving evidence for and against neo-Darwinism, theories of evolution, bacteriology; systematic study and laboratory work
10.50	12.50	The physics of the 20th century, including the General Theory of Relativity up to the discovery of quantum mechanics, is presented as a year course in modern physics (with an advanced calculus prerequisite) as it might have been given at Harvard, Cambridge, or Gottingen in 1925; physical and organic chemistry, also a year survey course, finish study of Henri Poincaré	Continue work on automobile; repeat experiments leading up to Bohr atom; handmade basic tubes for radio and oscilloscope; construct a more advanced radio and oscilloscope using tubes; make photocells, synthesize organic compounds	Introduction to cell biochemistry and advanced genetics; begin chromatography and electrophoresis for separating common biochemical constituents of mammals	The chemical structure of the constituents of life, isolating nucleic acids and proteins, determining their properties through chemical and spectrographic analysis; create genetic mosaics
10.75	12.75	Continuation of previous quarter; relate physical chemistry and organic chemistry to biochemistry; theory of x-ray machines and electron microscopes	Continuation of previous quarter; finish automobile; study of x-ray machines and electron microscopes; organic chemistry laboratory; motion pictures	Continuation of previous quarter; introduction to x-ray crystallography and electron microscopy for the study of large molecules and viruses	Continuation of previous quarter; use of x-ray crystallography to determine chemical structure; electron microscopy of viruses and large molecules

Avg. Level	Avg. Age	Psychosocial		Integration	
		Psychosocial Theory	Psychosocial Practice	Integrative Theory	Integrative Practice
10.00	12.00	The theories of Marx and Engels in detail, <i>Das Kapital</i> and the Dialectics of Nature; the ideas of August LeComte and social science in general; the psychology of William James	Critical essay on Marxism and dialectic materialism, what is wrong and what is right about theory, what is the scientific evidence for and against the theory; why is social science so full of nonsense?	Ethical analysis of Marxist philosophy and ethics; how and why Marxism violates the evolutionary ethic; read <i>The Brothers Karamazov</i> by Dostoyevsky	The music of Arnold Schoenberg, the plays of Frank Wedekind, the early paintings of Picasso and the Cubists; the opera <i>Lulu</i> by Alban Berg is performed
10.25	12.25	The philosophy of Nietzsche and Spencer; evolutionary ethics as propounded by Spencer; ethical Darwinism, an introduction to the life and ideas of Sigmund Freud, the rise of racist fascism in Europe	Essay comparing the neo-Darwinian ethics with Marxism; the incipient Lamarckianism in Marxism compared to its ethics; essay on European racism and fascism growing out of social Darwinism	Ethical analysis of neo-Darwinian philosophy and of social Darwinism; how and why social Darwinism and fascism violate the evolutionary ethic; Freud as a Newtonian psychologist looking for mechanistic explanations which may not exist; ethical implications of the unconscious	The music of Richard Strauss, <i>Ein Heldenleben</i> , <i>Also Sprach Zarathustra</i> , and the opera <i>Elektra</i> ; <i>Man and Superman</i> by G.B. Shaw is also performed
10.50	12.50	World history from 1910 to 1925; the basic writings of Lenin and a study of his life; World War I and the Russian Revolution, the world fear of communism, Leon Trotsky as an idealized communist; Freud's later works	Essay on the origins and consequences of World War I; essay on the origins and consequences of communism in Russia; essay on how the brilliant, ethical Trotsky went wrong and helped create a Frankenstein	An ethical analysis of how the Soviet Union betrayed its own revolution and turned into a monster; how the centralization of power makes corruption inevitable, read <i>Darkness at Noon</i> by Koestler and <i>Animal Farm</i> by Orwell	The music of Prokofiev and Shostakovich; the films of Sergei Eisenstein, including <i>Ivan the Terrible</i> ; perform the Shostakovich opera <i>Lady Macbeth of Murnansk</i> and Musorgsky's <i>Boris Gudenov</i>
10.75	12.75	World history 1925 to 1939; the basic writings of Mussolini, Hitler, fascism, Stalin, and Soviet communism; a study of Hitler and Stalin as complementary personalities who changed history; early works of Pavlov and Jung	Essay comparing the conflicting ideologies and economic factors leading to World War II; what could have been done to prevent World War II; why the United States was so immune to both communism and fascism	An ethical analysis of how capitalistic greed and the political cowardice and vindictiveness of the European democracies made World War II inevitable; Read <i>Winds of War</i> by Wouk	The music of Stravinsky, the early art of Dali, the films of Chaplin, Buñuel, Lang, and Pabst, plus Academy Award winners; perform Hindemith's opera <i>Mathis der Mahler</i> and Brecht's <i>Mahagonny</i>

Avg. Level	Avg. Age	Physical		Biological	
		Physical Theory	Physical Practice	Biological Theory	Biological Practice
11.00	13.00	Continuation of previous quarter; begin to focus chemical studies on biochemical processes and molecules; theory of ultracentrifuges and mass spectrographs	Continuation of previous quarter; begin construction of small airplane and learn to fly it; begin design and construct black & white television set; continue experiments in atomic and nuclear physics; study of ultracentrifuges and mass spectrographs	Continuation of previous quarter; use of mass spectrograph and ultracentrifuge	Continuation of previous quarter; use of advanced techniques to determine gross structure of RNA, DNA, and proteins
11.25	13.25	Continuation of previous quarter; begin an introduction to quantum mechanics and how it explained and enabled us to predict and control the facts that were causing paradoxes; study Pauling's work on the chemical bond	Finish small airplane; complete construction of black & white TV set; begin practice flying airplane; experiment with microwaves; build simple radar transmitters and receivers	Continue work of previous quarter; analysis of biochemical molecules and their reactions	Continue work of previous quarter; experimental physiological chemistry
11.50	13.50	The formal study of quantum mechanics continued; work of Bohr, de Broglie, Schroedinger, Heisenberg, and Bohm; critical experiments analyzed; Von Neumann's formalization of quantum mechanics into operators in Hilbert space; the predictive power of quantum mechanics, advanced theory of probability and statistics	Perform experiments to show that photons, electrons, and other quantum entities are both waves and particles; construct transistor, laser, and hologram; begin design and construction of color TV; begin design and construction of analog and digital computers	Biochemical analysis of DNA and RNA; how their structure was derived and how heredity and biological information is encoded in these molecules; relate to Pauling's work on the chemical bond	Biochemical isolation of DNA and RNA; preparing crystals for x-ray diffraction, determine their structure with exactitude; determine exact structure of insulin molecule
11.75	13.75	Continuation of previous works; Einstein's objections to quantum mechanics, including the EPRB paradox, and how these objections were resolved; quantum mechanics and chemistry	Continuation of previous experiments and constructions; experiments in superfluidity and superconductivity as macro quantum events	Molecular biology of the gene; how to read the genetic code; quantum processes in DNA	Experiments in gene splicing and working with recombinant DNA in bacteria; genetically engineered bacteria to produce human interferon

Avg. Level	Avg. Age	Psychosocial		Integration	
		Psychosocial Theory	Psychosocial Practice	Integrative Theory	Integrative Practice
11.00	13.00	World history 1939 to 1949; the later theories of C.G. Jung and I. Pavlov; the philosophy of existentialism	Write essay on the role of the United States in World War II and how it erred in its ethical obligations and thereby lost the peace; write essay on what the world and the United States would be like if the United States and England had united to prevent other nations from acquiring nuclear weapons	An ethical analysis of the factors leading to WWII and how democratic ideology is used to combat communism; the communist views of democratic capitalism, the democratic view of totalitarian communism; Read <i>War and Remembrance</i> by Wouk	Nazi films of Leni Riefenstahl; a study of <i>Citizen Kane</i> ; students write script, score, produce, and direct film of their own as group project using TV camera; study films of the Holocaust and World War II
11.25	13.25	The basic writings of Jean Paul Sartre, Camus and other modern existentialists; the philosophy of Teilhard de Chardin; an introduction to behaviorism starting with work of Watson	Write essay and contrast the ethical consequences of existential pessimism with evolutionary optimism, analyzing the social implications of a society that produces both; do simple conditioning experiments with rats	Ethical analysis of existentialism as the national philosophy of France and how that led to French defeat and collaboration in WWII; the creativity of the French	The films of Jean Renoir, Cocteau, and Clement; the music of "Les Six"; the paintings of Matisse and late Picasso, make a film in the French style
11.50	13.50	The writings of B.F. Skinner on behaviorism; study of the school of behavior therapy; animal and human comparisons; compare to the psychotherapy schools spun off from Freud	Conditioning experiments with rats, cats, and dogs; biofeedback experiments with humans; use of conditioning to break bad habits, compulsions, and phobias	Ethical analysis of the implications of behaviorism, show how this is a classical model of a quantum process; show how ethics can overcome conditioning and how ethics can also be destroyed by conditioning	Study of psychological films from <i>Spellbound</i> , <i>7th Veil</i> , and <i>The Cabinet to A Clockwork Orange</i> and <i>The Prisoner</i> ; as a group project make a B&W film satire of <i>Walden II</i>
11.75	13.75	A survey of 20th century philosophy after Bertrand Russell; start with G.E. Moore's writings on ethics; study <i>Tractatus Logicus Philosophicus</i> and Wittgenstein's <i>Philosophical Investigations</i> , Schlick's and Hare's work on ethics, Russell's analysis of matter and analysis of mind, Schroedinger's <i>What Is Life?</i> , The Vienna Circle, and Logical Positivism	Write essay on the relationship between science and the school of rational analysis; write essay on how the academic study of ethics is becoming trivia and unscientific, how can ethics be made scientific, why has no one taken the lead of Spinoza and continued working toward a rational scientific ethics?	Ethical implications of quantum mechanics for human behavior; relationship between determinism and free will; chance and necessity in evolution and human choice; read <i>Chance and Necessity</i> by Monod	Study the paintings of Dali and other surrealists; study Dali's films with Buñuel and Buñuel's later films; make a film as group project on expressing surrealism and ethics

Avg. Level	Avg. Age	Physical		Biological	
		Physical Theory	Physical Practice	Biological Theory	Biological Practice
12.00	14.00	A one-year synthetic study in cosmology uniting field theory, particle physics, and the Big Bang theory; show the evolution of matter, space, and time from the instant of the Big Bang to the present; discuss alternative explanation such as the steady-state theory	Astronomical observations of astrophysics, quasars, and possible black holes; the different types of galaxies are observed; the red shift and radio astronomy are studied and observed; results of experiments in high-energy particle physics are analyzed	A year study of chemical evolution after Blum, Calvin, and Manfred Eigen; show possible deterministic origins for DNA and protein and how autopoiesis might start as a quantum process; relate information and entropy, information theory and thermodynamics	Laboratory simulations of chemical evolution leading to protein and DNA through many different pathways; show how RNA encodes information to DNA
12.25	14.25	Continuation of previous quarter	Continuation of previous quarter	Continuation of previous quarter	Continuation of previous quarter
12.50	14.50	Continuation of previous two quarters	Continuation of previous two quarters	Continuation of previous two quarters	Continuation of previous two quarters
12.75	14.75	Continuation of previous three quarters; the latest cosmological models of Guth, Hawking, and Hoyle; their successors	Continuation of previous three quarters; observation of possible primordial strings as indicated by large gravitational lenses	Continuation of previous three quarters; trace a possible pathway to RNA, protein, DNA, cells	Continuation of previous three quarters; try creating simple proteins that when combined with RNA produce DNA in autopoiesis with the protein

Avg. Level	Avg. Age	Psychosocial		Integration	
		Psychosocial Theory	Psychosocial Practice	Integrative Theory	Integrative Practice
12.00	14.00	A survey of the leading theories of psychotherapy and humanistic and transpersonal psychology during the 20th century; show that they are transitory fads which almost never last and that they do not have a scientific base even though they produce millions of true believers	An analysis and essay on psychofraud as a human phenomenon; why will persons resist scientific explanation to behavior? why are clearly untrue fads with no scientific basis so popular? an essay on the human potential movement	The psychology of self-deception and its relationship to ethics; why is it possible to virtually eliminate self-deception from physical and biological science but not from social science?	The art of self-deception and quantum vision, the drawings of M.C. Escher, self-reference based drawings and paintings; study of the films of Stanley Kubrick, particularly <i>2001</i> and <i>A Clockwork Orange</i>
12.25	14.25	A survey of late 20th century economics beginning with Keynes' General Theory, covering the ideas of Paul Samuelson and Milton Friedman; supply-side economics and non-zero sum games; the economics of creativity	Essay on the inability of the leading economists to deal with creativity as the central factor in economic growth; the ethical obligations of the rich toward the poor	The economic implications of evolutionary ethics; the ethical implications of genetic engineering and eternal life; is it ever wrong to share knowledge? is it ever right to impede the flow of knowledge?	The music of Penderecki as a manifestation of 20th century entropy and ethical obligation; performance of Penderecki's <i>Dies Irae</i> and <i>The Devils of Loudon</i> and <i>Requiem</i>
12.50	14.50	A world history from 1950 to the present showing that no combination of socialism or capitalism is likely to work; show that Islam and all other societies alienated from western civilization are evolutionary deadends; the need for an alternative	Write essay showing how in their structure and in their actions both socialism and capitalism repeatedly violate the evolutionary ethic; essay on an alternative political socio-economic system to both capitalism and/or socialism	Art as a medium of protest; read Koestler, Pasternak, and Solzhenitsyn; read the latter's criticisms of the West; read the anticapitalistic writings from Clifford Odets to Arthur Miller's <i>Death of a Salesman</i> and <i>The Crucible</i>	Study the films of Costas Gavras as indictments of both socialism and capitalism; <i>Z</i> , <i>The Confession</i> , <i>State of Siege</i> , <i>Apocalypse Now</i> , and <i>The Godfather</i> series; begin a TV film as a group project expressing hope in the midst of an entropic world order
12.75	14.75	An introduction to a general theory of evolution unifying ethics, evolutionary theory and science; show the place for mysticism in the scheme of things and how mysticism inadequately balanced by science always leads to self-delusion; develop a thermodynamic, information-theoretic model of evolution and creativity	Write essay showing how to implement the general theory of evolution and the evolutionary ethic as an alternative socio-economic and political system on any scale in any country; take into account practical constraints; do a mathematical prediction of possible futures for evolution and creativity	Study the recent writings of ethical Christians within and without the Catholic church; see how Christianity and Judaism are evolving a more humanistic ethic more in harmony with the evolutionary ethic; relate to other major religions	Finish the film; write an essay on how persons who practice the evolutionary ethic can best communicate with adherents of each of the major religions, using art and common ethical values

Avg. Level	Avg. Age	Physical		Biological	
		Physical Theory	Physical Practice	Biological Theory	Biological Practice
13.00	15.00	Seminar on cosmology covering latest findings, theories, and alternative ideas, usually will cover the most important findings and breakthroughs of the last year; unify field theory, quantum mechanics, particle physics, and astronomy	Observations and computer simulations of cosmological models; derivation of original models	Seminar on genetic engineering and recombinant DNA; latest findings, ideas and theories	Experiments in engineering new life forms and correcting genetic defects in mammals
13.25	15.25	Seminar on chemical evolution leading to living cells; latest findings, theories, and ideas; how can autopoiesis be induced at the precellular level?	Experimental attempts to recreate the chemical evolution that led to the first cells in the laboratory; any form of chemical autopoiesis will be evaluated	Seminar on brain physiology and function; how the brain contributes to our intelligence and our mind; the brain as a classical device and the brain as a quantum device are emphasized	Experiments in understanding and enhancing brain function; life-style and the brain; EEG and brain physiology during autopoiesis
13.50	15.50	Seminar on the latest findings and discoveries in solid-state electronic devices, memory chips, microprocessors, pico-circuits, etc.; discuss performance, manufacturing techniques, and areas for new research; solid-state physics and chemistry appropriate to these devices	Laboratory and experiments on how to create micro- and pico-circuits; developing the crystals and modifying them; design and construction of advanced computers	Seminar on human health; how to prevent and cure diseases; focus on viral infections, degenerative diseases, and the aging process	Laboratory and clinic on preventive medicine and health maintenance for maximization of creativity
13.75	15.75	Seminar on latest discoveries in macro quantum physics, lasers, holography, super-conductivity; developments of other important technologies like quantum computers, artificial intelligence, and any technological breakthrough in any field; also, extensions of EPR and nonlocal interactions	Laboratory and experiments with important new technologies and processes covered in or related to the accompanying seminar; quantum technologies and advanced energy systems are experimentally treated	Seminar on the latest findings in biological evolutionary theory, particularly scientifically plausible deviations from orthodox Darwinian paleontology, genetic distance, and other findings relevant to evolutionary biology	Laboratory and field studies in paleontology, evolutionary genetics, and computer modelings of the evolutionary process, particularly relating to rates of evolution, punctuated equilibrium, and quantum evolutionary processes in evolution

Avg. Level	Avg. Age	Psychosocial		Integration	
		Psychosocial Theory	Psychosocial Practice	Integrative Theory	Integrative Practice
13.00	15.00	Seminars in evolutionary ethics and the general theory of evolution as an integrating theory in the social sciences; correct theory where it seems wrong and extend where it seems right; test the theory entirely by its ability to predict	Use the general theory of evolution to integrate the social sciences and other sciences when possible into a unified whole using mathematical models and emphasizing information theory and thermodynamics	Seminar on the latest developments in art which express a synthesis of ethics, humanities, and technology	Experimental creation of films, study of original films and their techniques; other techniques that integrate ethics, humanities, art, and technology
13.25	15.25	Seminar on human creativity and how to maximize it; show relationship between ethics and intelligence and how to maximize their interactions; study the interaction of ethics, science, technology, mysticism, and human organization; show both negative and positive findings	Experiments in how to maximize creativity for different persons in different environments; test the limits of what can be done for persons driven by fear who have not been able to make a commitment to the evolutionary ethic; test to see what can be done environmentally to maximize intelligence for those who are committed	Seminars on musical theory and composition; development of notation and expressive media for dance and opera; discuss latest work with high ethical content	Original composition of music, dance, and opera; performances of new works and interactions with latest technologies
13.50	15.50	Seminar on the economics of creativity and how best to organize the creative economic output of individuals; compare to other work in economics and the latest findings in these fields; test and improve the theory of creative transformation, octet formation, and autopoiesis	Laboratories in alternative forms of human organization for maximizing economically relevant creativity; kinds and numbers of persons and how best to communicate and assure creative feedback; are there creative alternatives to self-screening and selection into octets?	Seminars on the latest developments in the plastic arts, drawing, painting, sculpture, carving, ceramics; new forms, styles, and techniques are discussed; emphasis is on art with an ethical content	Workshops in the plastic arts; individual and group projects in any combination of plastic arts
13.75	15.75	Seminar on the prediction of historical and social events using the general theory of evolution and other techniques that made correct predictions in the past	Laboratory on how to organize octets into larger systems without losing creative output; how to delegate power within systems of octets without producing corruption and a loss of liberty; experimental techniques for predicting social changes and the future	Seminar on world literature and philosophy, what is being expressed and how, how it relates to the general theory of evolution, what can be incorporated into the general theory, and what is detrimental to its development	Critical readings and group discussions of important literary, philosophical, and religious writings; write alternatives to rejected ideas